

The Reliability and Legality of Online Education

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Abstract

Today, the classroom beyond the border through online Open University education in Nigeria has made it possible for many students to obtain university degrees. However, the reliability and legality of such degrees have become questionable. This paper is a descriptive exploratory case study regarding the public and private sector end-users, whose views and perceptions about the significance of online degrees should be used as a basis for assessing the reliability and legality of online education. A population of 118 was considered for the most urgent responses. The main instruments that were used to gather data from the respondents for the study included the questionnaire and checklists and the data collected were analyzed using relevant statistical tools. The results obtained were subjected to Pearson Product Moment Correlation Coefficient, PPMCC. The value of the reliability(r) after computation showed the level of reliability of the test to be 0.67, but the mean rating for the legality was very low indicating a non-authentic assessment of the educational system. Some suggestions were proposed to strengthen reliability and legality of the programme.

Keywords: online education, reliability, legality, strengthening

Introduction

Today, the classroom beyond the border through online Open University education in Nigeria has made it possible for many students to obtain university degrees. Due to the rapid growth of information technology and multi-media, computers and networks have become increasingly important in many areas of modern society, including teaching and learning (Dover, 2000 and Rovai, 2002). Schools and universities have adopted web-based technologies to support their students in both traditional coursework as well as online learning (Phipps and Merisotis, 1999). As web-based education is diffusing across countries, educational levels—in particular the universities and disciplines, the question for Nigerian Open University is no longer whether to adopt web-based learning, but how reliable and legal such degrees can be (Tucker, 2000; Ryan, 2001; Olson and Wisher, 2002; Clarke, Butler and Schmidt-Hansen, 2004; Olfos and Zulantay, 2007; Weller, 2002; Yu, 2005; Randolph and Crawford, 2013; Wilkerson and Elkins, 2000). Reliability is the probability of performing without failure, a specific function under given conditions for a specified period of time and is normally determined by assessment. It concerns the ability of different researchers to make the same observations of a given phenomenon if and when the observation is conducted using the same method(s) and procedure(s). Educational assessment (initial, formative and summative) is the process of gauging, usually in measurable terms, knowledge, skill, attitudes, and beliefs (Orde, 2001). Assessment can focus on the individual learner, the learning community (class, workshop, or other organized group of learners), the institution, or the educational system as a whole (Weller, 2002). Assessment is said to be consistent if it can produce similar results when it is used again in similar situations (Committee on Standards for Educational Evaluation, 2003). In studying to be assessed, students are to learn within a legal framework which guides their worthiness in character, ie to be honest, responsible and reliable in the world of work. Legality is conformity with the requirements for the award of the degrees and therefore, which entitles the recipient of the degrees to pro rata benefits. In accordance with the standards, students are required to maintain up-to-date knowledge and understanding of and to act within the statutory frameworks which set out their behaviour and responsibilities. The essence of introducing legal order in education is to guide the operation of the system, the standards and the behaviour of participants in the system, but pertaining to the behaviour of graduates of online education, can their behaviour be assessed vis-à-vis their academic performance? Decree 6 of 1993 touched on amendment to education minimum standards and establishment of institutions decree. The most pertinent aspects of the decree deal with students' rights and responsibilities and the suspension/expulsion provisions of the decree. Students' rights and responsibilities would fall under the value of attendance, student conduct, student record, liability for damage, suspension, expulsion and the appeal process. It is undisputed that the school can discipline its students within the school campus during class hours. Whether that authority applies even outside of the school premises and class hours for the online degree students is yet undetermined. The real issues are how do these apply to online degree students and how have they been assessed before conferring on the students the award of degree, which is not only based on their academic performing but also centered on character or behavior?

As public and private sector are the end-users of the graduates from online university degrees, there is a

need to examine how they perceive the degree in everyday working life evaluated by its end-users in a working context in respect of its reliability and legality.

Research Questions and Hypotheses

Two research questions and two hypotheses were formulated as follow:

Research Question 1: Is the university education offered through online reliable?

Research Question 2: What is the legality of the university education offered online?

Hypothesis I: There is no significant difference in the mean ratings of on the reliability of online and conventional classroom university degrees

Hypothesis II: There is no significant difference in the mean ratings of the legality of online and conventional classroom university degrees.

In order to answer the two questions and two hypotheses, a questionnaire was formulated.

Method

The descriptive survey design was used in this study. A total population of 120 respondents were contacted. The questionnaire used as the main instrument was structured into two parts: items dealing with reliability and items dealing with legality. A total of 45 items, 25 bordering on reliability and 20 on legality were addressed in the questionnaire. The questions on reliability were put a five point Likert scale with responses ranging as very high, VH (5 points); high, H (4 points), Average, A (3 points); low, L (2 points) and very low, VL (1 point). Similarly, the questions on legality were put a five point Likert scale with responses ranging as strongly agreed, SA (5 points); agreed, A (4 points), undecided, U (3 points); disagreed, D (2 points) and strongly disagreed, SD (1 point). The questionnaire was administered and collected from the respondents by the researchers. In terms of the population size for the analyses in this study, a total of 112 participants completed the survey. Of these, 106 had complete data for all 40 items and 102 had complete data for the 30 items retained. After taking the mean for each item, there were 100 cases after 5% trimming. Of the 100 cases, 98 cases had complete data for the final set of 30 items. This is 81.67% response. Due to the smallness, the entire population, which permitted us to infer from the segment of the population (from which it is more feasible to collect data) to a larger population, was used for the study.

The data collected were analyzed with Microsoft Office Excel 13 and SPSS 21 using relevant statistical tools: frequency, means, Pearson Product Moment Correlation Coefficient, PPMCC, standard deviation and the paired t-test. The decision was that any PPMCC greater than 0.1655 for the 98 samples was significant (otherwise it is insignificant) and any mean less than 3 is low (otherwise it is high). In order to have a quantitative measure of difference, first a decision was made as to whether the variances (variance is a measure of error within a system and it was possible to look for significant sources of error by this means) of the online education values,, VAR00001 and conventional classroom education values VAR00002 can be regarded as equal; if so the variances are 'pooled' so that the total estimate of the variances is obtained. The effects of the two samples on several items, which are paired off in the sense of being subjected to identical conditions may be compared. Considering that only the items listed are acting factors, there results a set of differences and the null hypothesis was that the mean of such differences is zero (that is, $\Omega=0$). Therefore, a paired samples t-test technique was applied, which is indicative of existence of real difference in sample means. The approach did eliminate factors other than the true difference in effects of the two methods of test and therefore, was more sensitive as statistical tool for analysing the results. Besides, its use did not involve the application of F-test to first validate the result. On paired sample t-test, this, therefore, gives $(N-1)$ 19 and 11 degrees of freedom for reliability and legality respectively. From tables at the α -risk of 5% the decision was that the significant values are found to be $|t| \leq \pm 2.077$ for reliability and $|t| \leq \pm 2.209$ for legality respectively; otherwise the values are insignificant.

Results and Analysis

Results from 32 items are compared for the online and conventional classroom education are shown in tables 1 and 2, and figures 1 and 2.

Table 1: Frequency and Mean Rating on Reliability of Online and Conventional Classroom University Education

Item	The Reliability of Online Education	Response	Frequency		Mean	
			VAR 00001	VAR 00002	VAR 00001	VAR 00002
1	The performance of online degree graduates against that of other conventional degree graduates	VH	11	6	2.980	3.133
		H	18	27		
		A	30	43		
		L	36	18		
		VL	3	4		
2	Online degree graduates cannot demonstrate that they have learned the required material when writing exams.	VH	13	4	2.939	3.235
		H	14	35		
		A	28	43		
		L	40	12		
		VL	3	4		
3	The overall validity, accuracy, and fairness when it comes to assessing online degree students	VH	10	8	2.847	3.367
		H	14	35		
		A	28	43		
		L	43	9		
		VL	3	3		
4	Balance of generic and specialist skill formation through the study	VH	10	5	2.693	3.071
		H	14	31		
		A	20	32		
		L	44	26		
		VL	10	4		
5	How repeatedly useful is the online degree knowledge	VH	6	8	2.551	2.908
		H	16	17		
		A	18	32		
		L	44	40		
		VL	14	1		
6	Skills meeting the needs of emerging and multidisciplinary functions	VH	8	8	2.673	2.990
		H	16	17		
		A	20	40		
		L	44	32		
		VL	10	1		
7	How dependable and confirmable is the online degree knowledge	VH	8	7	2.633	2.959
		H	16	16		
		A	17	42		
		L	46	32		
		VL	11	1		
8	How do you assess the benefit from them	VH	8	8	2.612	2.980
		H	16	17		
		A	17	39		
		L	44	33		
		VL	13	1		
9	Ability for the online degree students to interpret (comprehend/understand) a phenomenon from an <i>emic</i> (insider), as well as an <i>etic</i> (outsider) perspective	VH	6	11	2.571	3.276
		H	14	29		
		A	25	40		
		L	38	12		
		VL	15	6		
10	That the online degree students evaluations will provide sound, accurate, and credible information about their learning and performance	VH	8	7	2.439	2.949
		H	12	18		
		A	15	41		
		L	43	27		
		VL	20	5		

11	Focus on mastery of many components and fluency of their study	VH	8	7	2.480	2,990
		H	12	18		
		A	15	41		
		L	47	31		
		VL	16	1		
12	Exposure to pattern, efficiently recognizing and responding to pattern, and recognizing patterns in other contexts.	VH	2	6	2.450	2.847
		H	15	14		
		A	24	41		
		L	41	33		
		VL	16	4		
13	What is the relationship between the students and their teachers to make them fit into the world of world	VH	2	10	2.796	3.132
		H	21	25		
		A	32	32		
		L	41	30		
		VL	2	1		
14	Application of group problem-solving strategies.	VH	2	8	2.878	3.031
		H	2	23		
		A	2	32		
		L	2	34		
		VL	2	1		
15	Establishment of productive working techniques	VH	3	3	2.908	3.031
		H	23	31		
		A	37	34		
		L	32	26		
		VL	3	4		
16	How much <u>knowledge</u> , <u>skill</u> , <u>attitudes</u> , and <u>beliefs</u> learnt	VH	2	6	2.918	3.327
		H	25	43		
		A	38	27		
		L	29	21		
		VL	4	1		
17	Keen interest and ability to ask questions	VH	2	8	2.959	3.173
		H	29	27		
		A	34	41		
		L	29	18		
		VL	4	4		
18	Dependability on training skills for workplace	VH	1	8	2.980	3.490
		H	31	44		
		A	34	35		
		L	29	10		
		VL	3	1		
19	Adaptability to workplace requirements	VH	1	6	2.735	2.990
		H	22	23		
		A	30	41		
		L	40	20		
		VL	5	8		
20	Ability to improvise in working place	VH	1	6	2.714	3.051
		H	22	26		
		A	25	43		
		L	48	13		
		VL	2	10		

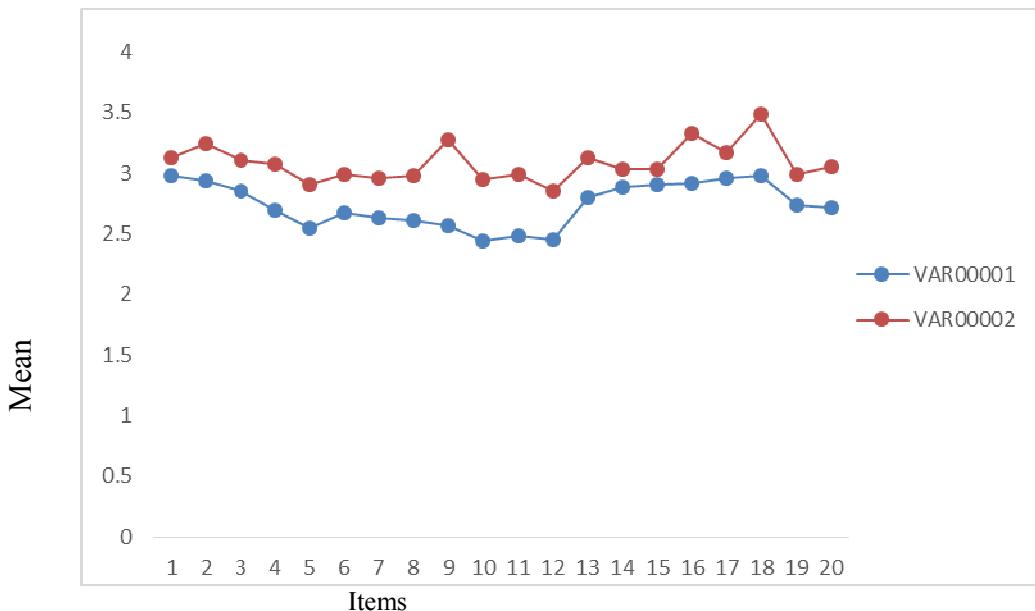


Figure 1: Mean Rating on Reliability of Online and Conventional Classroom University Education

Table 2: Paired Samples Statistics, Correlations and T-Test on Reliability of Online and Conventional Classroom University Education.

(a) Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	VAR00001	2.738	20	.1833	.04098
	VAR00002	3.084	20	.1560	.03487

T-TEST PAIRS=VAR00001 WITH VAR00002 (PAIRED)//CRITERIA=CI(.9500)

(b) Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)			
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference							
					Lower	Upper						
Pair 1	VAR00001 - VAR00002	.1411	.0316		-.4120	-.2799	-10.97	19	.000			

(c) Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	VAR00001 & VAR00002	20	.665	.001

Table 3: Frequency and Mean Rating on Legality of Online and Conventional Classroom University Education

Item	The Legality of Online Education	Response	Frequency		Mean	
			VAR 00001	VAR 00002	VAR 00001	VAR 00002
1	It is undisputed that the school can discipline its students within the school campus during class hours. Whether that authority applies even outside of the school premises and class hours for the online degree students is yet undetermined.	SA	3	18	2.468	3.500
		A	6	34		
		U	34	27		
		D	46	17		
		SD	9	2		
2	How has the issue of character been assessed before conferring on the online students the award of degree, which is not only based on academic performance but also on character or behavior	SA	2	5	2.418	3.286
		A	6	42		
		U	34	33		
		D	45	12		
		SD	11	6		
3	For a school system to function properly, the conduct students must conform to conditions that are conducive to learning, but no such conditions are set for online studies	SA	2	4	2.357	3.245
		A	5	40		
		U	31	33		
		D	48	18		
		SD	12	3		
4	The school must ensure that adequate steps are taken to maintain peace and order within the campus premises and to prevent the breakdown thereof, but these does not apply in online studies	SA	1	3	2.653	3.143
		A	12	38		
		U	38	33		
		D	46	18		
		SD	1	6		
5	Every schools shall have the right to promulgate reasonable norms, rules and regulations it may deem necessary and consistent with the provisions of the educational laws for the maintenance of good school discipline and class attendance, but class attendance is difficult to measure with online studies	SA	3	4	2.400	3.224
		A	5	39		
		U	31	35		
		D	48	15		
		SD	11	5		
6	Acts and/or omission which by certain school rule of conduct and standard of morality are subject to disciplinary action and imposition of sanctions, but this is not the case for an online student who has to read from home	SA	1	23	2.735	3.622
		A	14	32		
		U	42	27		
		D	40	15		
		SD	1	1		
7	The penalty of fine is usually imposed on students who violate internal traffic, cleanliness, and other rules and regulations, but the school is unable to discipline the online student in this regard	SA	1	2	2.633	3.224
		A	11	36		
		U	38	44		
		D	47	14		
		SD	1	2		
8	How offense committed relevant to the academic subject is handled is not clear with online studies	SA	1	2	2.571	3.235
		A	11	37		
		U	36	42		
		D	45	16		
		SD	5	1		
9	The measure of academic achievement must not be based on conduct, but for the online studies, the conduct cannot even be observed or assessed.	SA	2	2	2.653	3.255
		A	15	40		
		U	32	38		
		D	45	17		
		SD	4	1		
10	A school, before promoting or graduating a student, must be sure that he/she (the student) is functionally literate to go through next higher level	SA	4	23	2.469	3.765
		A	4	41		
		U	4	24		
		D	4	8		
		SD	4	2		
11	When students misbehave outside the campus and the misconduct complained of directly affects the offender's status as a suitable member of that community, there is no reason why schools may not impose disciplinary sanctions on him	SA	5	11	2.510	3.296
		A	5	28		
		U	34	42		
		D	45	13		
		SD	9	4		
12	Staff-students relationship/teacher shall place premium upon self-respect and self-discipline as the principle of personal behavior in all relationships with others and in all situations.	SA	3	2	2.714	3.214
		A	17	41		
		U	33	37		
		D	39	12		
		SD	6	6		

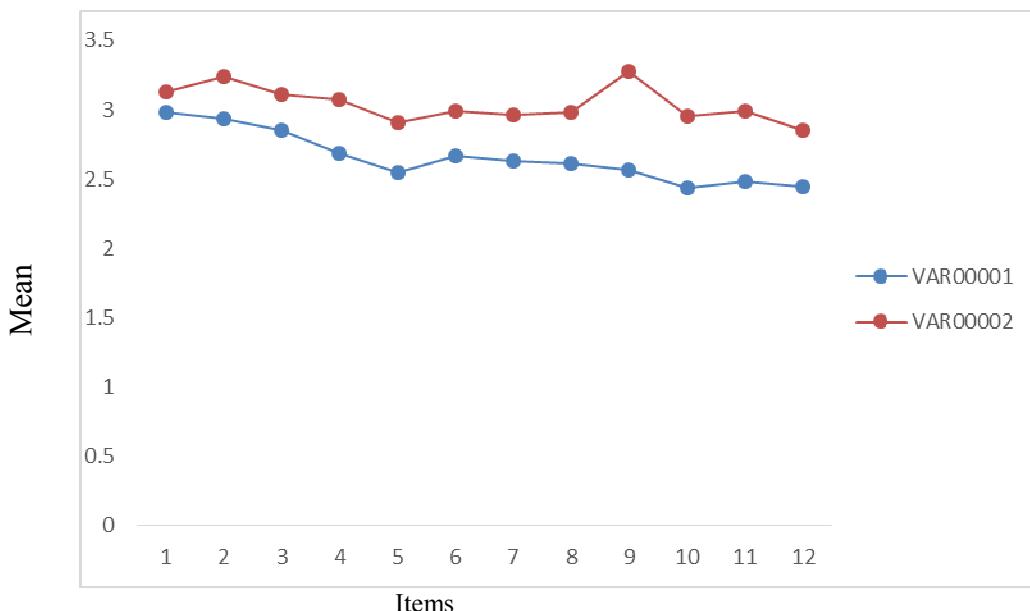


Figure 2: Mean Rating on Legality of Online and Conventional Classroom University Education

Table 4: Paired Samples Statistics, Correlations and T-Test on Legality of Online and Conventional Classroom University Education

(a) Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1	2.5485	12	.12847	.03708
VAR00002	3.3341	12	.19047	.05498

(b) T-TEST PAIRS=VAR00001 WITH VAR00002 (PAIRED)//CRITERIA=CI(.9500)

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)			
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference							
					Lower	Upper						
Pair 1	VAR00001 - VAR00002	-.786	.23453	.0677	-.9346	-.6366	-11.60	11	.000			

(c) Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 VAR00001 & VAR00002	12	-.045	.888

Discussion

Table 1 and figure 1 reveals that the mean ratings on reliability for the online education is low (below the average of 3) than the mean ratings, which are above the average of 3 for the conventional classroom university education in all the 20 items. The average of the mean ratings for online education was found to be 2.738 while that of conventional classroom education was 3.084. The t-test of -10.97 in table 2b means that the value is significant and as such the hypothesis that there is no significant difference in the mean ratings of the reliability of online and conventional classroom university degrees was rejected. The test of the hypothesis only indicates acceptance or rejection. Therefore, it is required to obtain a level of confidence interval, which apart from giving a measure of reliability, also provides index of reliability, r . The closer r^2 is to 1, the less the sum of squares due to errors. When the values are correlated as in table 2c, the level of reliability of the online education was found to be 0.67 (0.665) on Pearson Product Moment Correlation Coefficient, PPMCC. This implies that the performance-based assessment is similar with both systems of education as they focus on almost the same

achievement. Though ideally the online education is significantly different from the conventional classroom, they are most commonly associated with standards-based assessment which use free-form responses to standard questions scored by human scorers on a standards-based scale, meeting, falling below or exceeding a performance standard rather than being ranked on a curve. This implies that the performance-based assessment is similar with both systems of education as they focus on almost the same achievement. Though ideally the online education is significantly different from the conventional classroom university education, it is most commonly associated with standards-based assessment which use free-form responses to standard questions scored by human scorers on a standards-based scale, meeting, falling below or exceeding a performance standard rather than being ranked on a curve.

Similarly, table 2 and figure 2 also shows that the mean ratings on the legality for the online education is low (below the average of 3) than the mean ratings, which are above the average of 3 for the conventional classroom university education in all the 12 items enumerated. While the average of the mean ratings for online education was found to be 2.549 while that of conventional classroom education was 3.334. The t-test of -11.60 in table 4b means that PPMCC. In the circumstance, the hypothesis that there is no significant difference in the mean ratings of the legality of online and conventional classroom university degrees was also rejected. A correlated value of -0.045 on PPMCC in table 4c, which very low indicates a non-authentic assessment legality of the educational system. It therefore, means that these legal issues should be addressed in manner that give credit to the degrees be awarded. Behavior must be attended to, and with some exactness, because it is through the flow of behavior – or, more precisely, social action – that performance find articulation.

Recommendation

Besides the questionnaire, recommendations were based on depth Interviews (in the field, face-to-face), participant observation, (field/site visits) and archival research (document review and analysis)

Each online programme should present and elaborate a set of standards for use in a variety of educational settings. Such standards will provide guidelines for designing, implementing, assessing and improving the identified form of evaluation. Each of the standards should be placed in one of four fundamental categories to promote educational evaluations that are proper, useful, feasible, and accurate

A system of online education that mandates standardized testing nationwide should be adopted. The tests should align with national curriculum and link teacher, student, state and nation accountability to the results of these tests. This will offer a tangible method of gauging educational success, holding teachers and schools accountable for failing scores, and closing the achievement gap across the various online programs and with the conventional classroom university education

The test results can be compared against an established criterion, or against the performance of other students, or against previous performance. For most researchers and practitioners, the question is not whether tests should be administered at all—there is a general consensus that, when administered in useful ways, tests can offer useful information about student progress and curriculum implementation, as well as offering formative uses for learners (). The real issue, then, is whether testing practices as currently implemented can provide these services for educators and students.

Confidence-based learning, which accurately measures a learner's knowledge quality by measuring both the correctness of his or her knowledge and the person's confidence in that knowledge should be encouraged.

The online programs should have electronic-scape, a technology and approach that looks specifically at the assessment of creativity and collaboration.

Along with the online education, there should be electronic portfolio, which is a personal digital record containing information such as a collection of artifacts or evidence demonstrating what the student knows and can do.

Legal impact assessment, which looks at the potential health impacts of policies, programs and projects that are eventually assigned to the students should be carried out. Legal/socials impact should be able to looks at the possible social impacts of proposed new online program, behavioural consequences or development activities.

Performance formats are to further be differentiated into products and performances. The performance may result in a product, such as a writing, portfolio, paper or exhibition, or it may consist of a performance, such as a speech, seminar presentation, knowledge recital or reading.

Webcasting of educational material has become one of the most important services available on the Internet. Common forms include live transmission or rebroadcasts of lectures, classroom work, seminars (sometimes organized as “webinars” from different locations), as well as videos of conferences, press briefings, and other information presentations. The ability to archive webcasts makes educational material available to users on-demand and at convenient times.

Complex legal issues surround the webcasting of content covered by copyrights, commercial ownership rights, royalties, and other intellectual property protections. Because the content is accessible globally as well in the country of origin, international bodies such as the World Intellectual Property Organization (WIPO) are often

involved. In addition, censorship and other kinds of government restrictions may be invoked against content available as webcasts.

In all branches of intellectual property, the legal system should seek to balance two competing concerns. On the one hand, protection must be strong enough to encourage authors and inventors to invest the necessary effort in innovation. On the other hand, the law must also allow people some freedom to use the intellectual property of others that are online. This is because artistic, technological, and commercial progress always requires building on the work of others.

To strike this balance, all branches of intellectual property law confer general rights on creators but also limit those rights with a variety of exceptions. For example, in patent law, a scientist may use someone else's invention to conduct experiments. Similarly, copyright law allows a literary critic to quote passages of a novel in a review. Under trademark law, a company may use a competitor's brand name in a comparative advertisement. In all these ways, intellectual property law tries to be flexible enough to protect the property rights of the creator while also allowing the public to benefit from the protected work.

Conclusion

A correlation of the results on reliability of the online education and interpretations show similarities and coherence with the conventional classroom university education. The value of the reliability(r) after computation showed the level of reliability of the test to be 0.67, but the legality, the mean rating shows a wide discrepancy and the correlation was very low indicating a non-authentic assessment of the legality of the educational system.

References

Bolliger, D. U., & Inan, F. A. (2012). Development and validation of the Online Student Connectedness Survey (OSCS). *The International Review of Research on Open and Distance Learning*, 13(3), 41-65.

Clarke, M., Butler, C., & Schmidt-Hansen, P. (2004). Quality Assurance for Distance Learning: A case study at Brunel University. *British Journal of Educational Technology*, 35 (1), 5-11.

Committee on Standards for Educational Evaluation. (2003). *The Student Evaluation Standards: How to Improve Evaluations of Students*. Newbury Park, CA: Corwin Press.

Dover. Carr, S. (2000, February 11). As Distance Education Comes of Age, the Challenge Is Keeping the Students. *The Chronicle of Higher Education*. Retrieved on 20 January, 2015. <http://chronicle.com/article/As-Distance-Education-Comes-of/14334>

Lave, J. (1991). Situating Learning in Communities of Practice. In L. B. Resnick, J. M. Levine and S. D. Teasley (Eds.), *Perspectives on socially shared cognition*, Washington, DC: American Psychological Association, 63-82.

Olfos, R., & Zulantay, H. (2007). Reliability and Validity of Authentic Assessment in a Web Based Course. *Educational Technology & Society*, 10 (4), 156-173.

Olson, T., & Wisher, R. (2002). The Effectiveness of Web-Based Instruction: An Initial Inquiry. *International Review of Research in Open and Distance Learning*; 3 (2), retrieved on 20 January, 2015. <http://www.irrodl.org/index.php/irrodl/article/view/103/182>.

Orde, B. (2001). Online Course Development: Summative Reflections. *International Journal of Instructional Media*, 28 (4), 397-403.

Phipps, R., & Merisotis, J. (1999). What's the difference? A Review of Contemporary Research on the Effectiveness of Distance Learning in Higher Education. *The Institute for Higher Education Policy*. Washington DC.

Randolph Justus J. and Crawford Linda M. (2013). Factorial Validity and Reliability of the Sense of Community in Online Courses Scale, *Journal of Interactive Online Learning* Volume 12, Number 2. 53-68. Retrieved on 10 January, 2015. www.ncolr.org/jiol

Rovai, A. P. (2002a). Building Sense of Community at a Distance. *International Review of Research in Open and Distance Learning*, 3 (1). Retrieved on 10 January, 2015. <http://www.irrodl.org/index.php/irrodl/article/view/79>

Ryan, W. J. (2001). Comparison of Student Performance and Attitude in a Lecture Class to Student Performance and Attitude in a Telecourse and a Web-Based Class, Ph.D. Dissertation No. ED467394, Nova South Eastern University.

Si Fan and Quynh Lê (2011, September 3). Developing a Valid and Reliable Instrument to Evaluate Users' Perception of Web-Based Learning in an Australian University Context. *MERLOT Journal of Online Learning and Teaching*. 7 (366)

Tu, C. (2002). The Measurement of Social Presence in an Online Learning Environment. *International Journal on E-Learning*, 1(2), 34-45.

Tucker, S. (2000). Assessing the Effectiveness of Distance Education versus Traditional On-Campus Education. Paper presented at the Annual Meeting of the AERA, April 24-27, 2000, New Orleans, Louisiana,

USA.

Weller M. (2002). Assessment Issues on a Web-based Course. *Assessment & Evaluation in Higher Education*, 27 (2), 109-116.

Wilkerson, J., & Elkins, S. (2000). CAD/CAM at a Distance: Assessing the Effectiveness of Web-Based Instruction to Meet Workforce Development Needs. Paper presented at the Annual Forum of the Association for Institutional Research, May 21-24, 2000, Cincinnati, OH, USA.

Yu, Chong Ho (2005). Reliability and Validity. *Educational Assessment*. Available at Creative-wisdom.com. Retrieved January 20, 2015.